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PUBLICATIONS AND PATENTS

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BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY
AGRICULTURAL RESEARCH ADMINISTRATION
UNITED STATES DEPARTMENT OF AGRICULTURE

Article No.

ARTICLES AND ADDRESSES

Apparatus, Analytical Methods, and Techniques

1 deGRUY, Ines V., and ROLLINS, Mary L.

A MICROSCOPICAL TECHNIQUE FOR DETERMINING LATEX DISTRIBUTION IN TIRE CORDS. Textile Research J. 18 (6), 371-3 (1948).

An investigation of latex-dipped tire cords has resulted in the development of a simple microscopical technique which may be of interest in evaluating different latices for cord dipping or various cord constructions for latex adhesion. The procedure involves differential staining and cross-sectioning of the cord to demonstrate the location of latex solids in situ. A detailed description of the method is accompanied by photomicrographs illustrating the results obtained.

2 HALL, Catherine M., CASTILLON, Leah E., GUICE, Wilma A., and BOATNER, Charlotte H.

APPLICATION OF ANTIMONY TRICHLORIDE-SPECTROPHOTOMETRIC METHOD TO THE DETERMINATION OF GOSSYPOL IN COTTONSEED AND COTTONSEED PRODUCTS. J. Am. Oil Chemists' Soc. 25 (12), 457-61 (1948).

A technique is described which permits application of the antimony trichloride-spectrophotometric method to the determination of gossypol in a variety of cottonseed products. Gossypol is determined by means of the following series of operations: (1) extraction of gossypol from cottonseed or cottonseed products by use of chloroform or aqueous ethanol; (2) isolation of gossypol from the extracts by use of aqueous alkali; and (3) application of the antimony trichloride-spectrophotometric test. Data are presented to show the results obtained by application of this procedure to the determination of gossypol in pigment glands, raw cottonseed meats, cooked cottonseed meats, hydraulic- and screw-pressed meals, solvent-extracted meals, gland-free meals, and oils, both expressed and solvent-extracted.

3 O'CONNOR, R. T., HEINZELMAN, D. C., and JEFFERSON, M. E.

APPLICATION OF THE LINE-WIDTH METHOD TO THE SPECTROCHEMICAL ANALYSIS OF OILS, FATS, AND RELATED SUBSTANCES. J. Am. Oil Chemists' Soc. 25 (11), 408-14 (1948).

The line-width method applied to the spectrochemical analysis of oils and fats, in conjunction with an improved ashing technique, permitted quantitative determination by the authors of copper,

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iron, manganese, nickel, and tin in quantities as low as 1 part in 10 million. The procedure was critically examined by precision tests on commercial and experimental samples, by accuracy tests on synthetic samples, and by recovery tests. Results of actual analysis of 30 vegetable oils and fats indicate its usefulness as a research tool, especially in trace element analyses of organic materials that are low in ash content.

SEE ALSO NOS. 9, 19, 20 and 25.

Cotton and Cotton Products

4 DEAN, James D.

PRESERVING COTTON FABRICS IN OUTDOOR USE. USDA Circular No. 790, 17 pp., August 1948.

Woven cotton fabrics ranging from heavy duck to light shade cloth find many uses on the farm or ranch for such purposes as tents and awnings, coverings for machines, trucks, automobiles, sacked grain and stacks, covers for horses, shade for young plants and seedlings, and in similar uses. This circular tells how to select and care for these materials and describes simple methods of waterproofing and weatherproofing to prolong their serviceability. Protection from sunlight can be obtained by treatment with mineral pigments or other materials that absorb certain light waves. Danger of mildew can be reduced by treating the cloth with compounds that lower its capacity to absorb moisture or by adding substances that are poisonous to micro-organisms. Formulas for some of the treatments are given.

5 EVANS, Robert B.

COTTON'S INCREASING COMPETITION FROM SYNTHETIC FIBERS AND PAPER. Proceedings, Fifth Spinner-Breeder Conference, Greenville, Miss., September 21; pp. 30-4 (1948).

Trends in the consumption of textile fibers are brought up-to-date, and both present and prospective future competition between cotton and synthetic fibers, and between cotton and paper, are discussed in the light of existing economic conditions. With improvement in its quality and price position, rayon has been able to expand into more and more textile markets in recent years, although cotton still dominates the field. New synthetic fibers, including nylon, the vegetable protein fibers and glass fiber, are expected to make stronger and stronger bids for textile markets as they are improved through research. At the present time the market for about a million bales of cotton a year is threatened by growing

competition from paper in such products as bags, towels, handkerchiefs, napkins, window shades, plastics, and twine. Obviously, much more aggressive research, particularly of a basic nature, better merchandising, and the full support of all industries and agencies who have an interest in cotton, are needed if cotton is to maintain even its present position among competing products.

6 EVANS, Robert B.

SYNTHETIC FIBERS AND PAPER AS COMPETITORS OF COTTON. Presented before the Southwest Regional Meeting, American Chemical Society, Shreveport, La., December 10-11, 1948. Mimeographed. AIC-217, 12 pp.

A discussion of the current competitive situation between cotton and synthetic fibers, and between cotton and paper, is supplemented by six statistical tables, as follows: (1) Average estimated quantities of fibers made available for use annually by ultimate consumers in the United States during designated periods, 1892-1944, and annual totals for 1940-46; (2) Fibers made available for use by ultimate consumers in the United States during designated periods, 1892-1947, in percentages of the total; (3) Comparative prices of cotton viscose rayon staple, and acetate rayon staple, 1940-1948: (4) Production of cotton and rayon tire cord and fabric in the United States, 1939-1947; (5) Quantities of cotton fabric, burlap, and shipping sack paper used in bags in the United States, 1939-1947, and cotton equivalents; (6) Comparative prices of cotton, burlap, and paper flour bags, per thousand, 1940-48.

7 FIORI, Louis A.

EFFECT OF DRAFT DISTRIBUTION ON STRENGTH AND APPEARANCE OF COTTON YARN. Textile Industries 112 (6), 92-7 (1948).

Changes in drafts were studied with a view to assembling a system of drafting which would provide flexibility in mill operations without impairing yarn quality.

Four different varieties of cotton, representing extreme staple lengths, were used in identical experiments in which drafts were varied on the drawing, roving and spinning machines. The effect of these variations on skein strength and grade of a single coarse yarn (15.75s) was determined.

It was found that increases in draft on the drawing and roving frames did not materially affect either strength or grade, while increases in spinning drafts resulted in lower skein strength but had little or no effect on the grade of the yarn.

Article No.

8 FYNN, P. J., SANDS, J. E., and CAMPBELL, K. S.

CELLULOSE BEHAVIOR WITH FILTERED SUNLIGHT. Textile Research J. 18 (6), 350-7 (1948).

Samples of kier-boiled cotton sheeting, exposed to sunlight in a specially constructed cabinet designed to segregate sunlight from other factors and to keep the cloth flat and perpendicular to the sun, were compared with similar samples exposed on open racks facing the sun at various angles. Data were obtained which indicated that sunlight can account for practically all the degrading effects caused to cotton fabrics by prolonged weather exposure, except where pronounced microbiological action or damage obviously due to corrosive atmospheric contaminants is present. While the results of this study also corroborated the accepted view that short wave-length radiations in sunlight cause the greatest damage, the degrading effect was not limited to these rays, and some antagonism between energies from different portions of the spectrum was indicated.

9 GRANT, James N., and HORLIER, Ora W.

RELATION OF SPECIFIC STRENGTH OF COTTON FIBERS TO FIBER LENGTH AND TESTING METHOD. Textile Research J. 18 (8), 481-7 (1948).

The authors used four representative American cotton varieties, covering a range of such physical properties as strength, length and fineness, in a study to compare the individual fiber test with the Pressley flat-bundle test for determining fiber strength.

Four tables and five graphs supplement a detailed discussion of the experiments. Results are interpreted with due consideration to the fact that the selection of fibers which takes place in preparing samples for the flat-bundle test gives a bias towards the longer fibers. However, an increase in specific strength (breaking load divided by linear density and expressed as grams per grex) with increase in length was evident whether fibers were broken individually or in aggregates.

10 McCALL, Elizabeth R., CIRINO, Vidabelle O., STARK, Samuel M. Jr., and GUTHRIE, John D.

THE ORGANIC ACID CONTENT OF VARIOUS SAMPLES OF RAW COTTON FIBER IN RELATION TO ASH ALKALINITY AND LEACHING BY RAIN. Science 108 (2805), 360-1 (1948).

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A number of samples of raw cotton fiber of different varieties, grown in different places, were analyzed for citric acid, l-malic acid, pectic acid, total organic acids, ash alkalinity, moisture, and pH. The resulting data show that raw cotton fibers vary greatly in their content of organic acids, but the variation seems to be due more to environmental factors than to the variety of cotton. Rain and other weathering factors apparently have a profound effect on the content of organic acids, especially of l-malic acid. A rough correlation was found between the content of organic acids and the ash alkalinity of the analyzed samples.

11 MOORE, Harry B.

RETARDATION OF HEAT-INDUCED STRENGTH LOSS IN COTTON YARNS BY LIQUID AMMONIA TREATMENT. Textile Research J. 18 (12), 749-55 (1948).

In studies to determine the effect of various chemical treatments on improving the heat-resistance of cotton yarns and rovings, liquid ammonia gave promising results. Therefore, experiments were undertaken to determine the conditions under which treatment with ammonia produced the maximum retention of strength after prolonged periods of heating. The tests are described in detail, and findings are illustrated by charts and photomicrographs. The greater strength retention of treated yarns is believed to result from some frictional force operating between the constituent fibers under the conditions of the test, rather than to an increase in the strength of individual fibers.

12 REID, J. David, and DAUL, George C.

THE PARTIAL CARBOXMETHYLATION OF COTTON TO OBTAIN SWELLABLE FIBERS, II. Textile Research J. 18 (9), 551-6 (1948).

Previously reported research by the same authors was extended to determine the effect of partial carboxymethylation on cloth treated in the piece and on cloth woven from treated yarn. Treatment of cloth without tension gave a product of satisfactory hand and feel with lower water permeability and greater air permeability than for untreated material; cloth treated under tension had even greater air permeability but the decrease in water permeability was slight. Cloth was successfully woven from treated plied yarn, but the expected decrease in water permeability was not attained with the carboxymethyl substitution and the weaves used. Treated cloth absorbed water two to three times as fast as untreated cloth but took up only a little more than the total amount taken up by a mercerized control, and the drying rate was about the same.

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Carboxymethylation of cotton alters its dyeing characteristics and may serve as a starting point for other chemical changes.

13 SCHUYTEN, H. A., REID, J. David, WEAVER, J. W., and FRICK, John G. Jr.

IMPARTING WATER-REPELLENCY TO TEXTILES BY CHEMICAL METHODS: A REVIEW OF THE LITERATURE. Textile Research J. 18 (7), 396-415 (1948).

This is the first part of a review of 332 references gathered from the patent literature and from several selected journals on the production of water-repellency by chemical methods. The second half of the article appeared in Textile Research J. 18 (8), 490-503 (1948). See No. 14. A related index of compounds used to obtain chemical water-repellency was published by the U. S. Department of Agriculture in June 1948 as AIC-179. Only those processes were considered which involve a chemical reaction of the water-repellent agent with the textile fabric or with itself to give a fabric more or less repellent to water but permeable to air. These methods are not evaluated.

References are divided into groups according to the nature of the water-repellent agents discussed. The group dealing with acid halides, anhydrides and other esterifying agents, and the group dealing with quarternary nitrogen compounds, are included in the first part of the article.

14 SCHUYTEN, H. A., REID, J. David, WEAVER, J. W., and FRICK, John G. Jr.

IMPARTING WATER-REPELLENCY TO TEXTILES BY CHEMICAL METHODS: A REVIEW OF THE LITERATURE. Textile Research J. 18 (8), 490-503 (1948).

Second half of the article above (See No. 13), this part continues the discussion of water-repellent agents by groups as follows: esters and urethanes; amines, amides, and related compounds; aldehydes; polymers formed *in situ*; ethers, epoxides, and related compounds; cyanates, thiocyanates, and related compounds; urea derivatives; and silicon derivatives and miscellaneous compounds.

Article No.

15 SCOTT, Walter M.

NEW DEVELOPMENTS IN COTTON-- AN OLD CHEMURGIC CROP. Presented before the Southwest Regional Meeting, American Chemical Society, Shreveport, La., December 10, 1948. Mimeographed. AIC-216, 10 pp.

The research approach to improved usefulness of cotton and cottonseed is illustrated by examples of current investigations at the Southern Laboratory. Contributions to the chemistry of cotton and of cellulose generally are cited. Chemical modifications to form new products that resist damage from mildew, sunlight, or the penetration of water are explained. The new solvent method of fractionating cottonseed is discussed, and a brief description given of studies to determine the feeding value of deglanded meal and the chemical properties of pigment glands. Mention also is made of investigations of chemical treatments to lessen spoilage of cottonseed in storage.

16 SCOTT, Walter M.

SOME RECENT DEVELOPMENTS IN COTTON RESEARCH AT THE SOUTHERN REGIONAL RESEARCH LABORATORY. Presented before the Annual Meeting of the Textile Research Institute, New York, November 18-19, 1948. Mimeographed. AIC-215, 11 pp.

The objectives of research on cotton at the Southern Regional Research Laboratory are outlined and some of the major studies described. Investigations, which seek to maintain, develop, and extend the usefulness of cotton, fall into three general classes: a search for fundamental knowledge of the physical and chemical structure of the fiber is made with the idea of establishing a relation between basic properties and product performance; chemical finishes are developed to enhance the naturally fine qualities of cotton and to improve other qualities in which cotton is deficient; studies are made to develop new or improved machinery for more efficient and economical manufacture of high quality cotton yarns and fabrics.

Details of findings to date are given on tire cord research, weathering and rot-proofing experiments, investigations of water resistance, chemical modification of fiber and fabrics, and cotton processing research.

SEE ALSO NOS. 1, 33 and 34.

Article No.

Cottonseed, Peanuts, Rice, and Derived Products

17 ARTHUR, Jett C., MASON, T. W. Jr., and ADAMS, Mabelle E.

PEANUT PROTEIN PAPER COATINGS. J. Am. Oil Chemists' Soc. 25 (9), 338-40 (1948).

Details are given of an investigation to determine the conditions under which peanut protein, which soon may be available in commercial quantities, can be used as an adhesive in paper coating formulations.

Paper coated with peanut protein adhesive and mineral pigments gave high wax pick tests, the value depending on the type of protein, pigment, and dispersing agent, pH, protein-pigment ratio, and total solids content of the slip. Using neutralized protein as the adhesive, coating slips containing 40 percent solids were prepared with pH values as low as 6.3; and when these slips were applied to raw stock, the coating had wax pick values satisfactory for many printing operations. Over a pH range of 8 to 12, coatings prepared from unwashed protein gave high wax pick values, whereas those prepared with water-washed protein gave slightly lower values.

18 ARTHUR, Jett C. Jr., CROVETTO, A. J., MOLAISON, L. J., GUILBEAU, W. F., and ALTSCHUL, A. M.

PILOT-PLANT MANUFACTURE OF PEANUT PROTEIN. J. Am. Oil Chemists' Soc. 25 (11), 398-400 (1948).

A simplified process by which greater quantities of protein can be isolated from solvent-extracted meal is described. The improvement in operations followed a study of the effect on the settling rate of the precipitated protein of two factors: (1) temperature of the extract liquor during precipitation; and (2) the rate at which sulfur dioxide was added. As the rate of addition of sulfur dioxide was increased, and the temperature of the extract liquor was decreased, it was found that the density and the settling rate of the protein curd increased. Spray washing of the extracted meal proved to be more efficient than the previously reported dilution method of washing, and resulted in a greater yield of protein.

Article No.

19 BICKFORD, W. G., FISHER, G. S., DOLLEAR, F. G., and SWIFT, C. E.

AUTOXIDATION OF FATS. I. PREPARATION AND OXIDATION OF ALKYLBENZENE-MALEIC ANHYDRIDE ADDUCTS. J. Am. Oil Chemists' Soc. 25 (7), 251-4 (1948).

Experiments are described which show that certain alkylbenzenes having a hydrogen atom on the alpha carbon atom react with maleic anhydride to form compounds analogous to the hydroperoxides produced by autoxidation of the alkylbenzenes. The structure of these products was determined by oxidation with aqueous permanganate and the results were applied, together with other data, to demonstrate that the reaction proceeds by a free radical chain mechanism involving the abstraction of a hydrogen atom from the alpha carbon atom. In view of the analogy between the products obtained in this investigation and in autoxidation, it is suggested that autoxidation is propagated in a similar manner.

20 BICKFORD, W. G., FISHER, G. S., KYAME, Lillian, and SWIFT, C. E.

AUTOXIDATION OF FATS. II. PREPARATION AND OXIDATION OF METHYL OLEATE-MALEIC ANHYDRIDE ADDUCT. J. Am. Oil Chemists' Soc. 25 (7), 254-7 (1948).

The adduct of maleic anhydride and methyl oleate was prepared and characterized. Its physical and chemical properties indicate that it is composed of one mole of each of the reactants and that the double bond of methyl oleate is not saturated.

Oxidative fission of the adduct showed that the adduct consisted of a mixture of four isomers which yielded octanoic, nonanoic, suberic, and azelaic acids on ozonolysis. Isolation of these four acids from the fission products indicates that the addition reaction probably proceeds by a mechanism analogous to that proposed by other writers for autoxidation.

In view of the similarity between the reactions of maleic anhydride and oxygen with unsaturated compounds, the data gained from these experiments appear to support the free radical chain mechanism for the autoxidation of fats.

21 ALTSCHUL, A. M., KARON, M. L., and KYAME, Lillian

CATALASE AND PEROXIDASE IN GERMINATING COTTONSEED. Archives of Biochemistry 18 (1), 161-70 (1948).

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To obtain information concerning the role played by catalase and peroxidase in the production of energy, and especially to aid in developing methods for inhibiting their activity in cottonseed, these enzymes were investigated during the early period of germination.

The amount of extractable catalase decreased and that of peroxidase increased: in one experiment, the amount of extractable catalase went down to 13 percent of its value in resting seed, whereas the extractable peroxidase rose 21-fold in the course of a five-day period of germination. These changes occurred in both the radicle and the hypocotyl and cotyledons of the cotton seedling. However, the decrease in the amount of extractable catalase during germination was observed to be much greater than the decrease in total catalase.

It is suggested that one of the functions of catalase is to regulate, in conjunction with peroxidase, the amount of free energy of oxidation available for biological work.

22 ALTSCHUL, A. M., KARON, M. L., and SCHAEFER, H. C.

NOTE ON EFFECT OF CHICK GROWTH OF FEEDING MEALS PREPARED FROM FLAXSEED AND COTTONSEED TREATED WITH AMMONIA PRIOR TO STORAGE. Poultry Science 27 (4) 408-10 (1948).

Samples of meal produced from cottonseed and flaxseed which had been treated with ammonia and stored several months prior to processing were evaluated as protein supplements in chick diets. It was found that meal from ammonia-treated flaxseed was equal in value to commercial soybean and cottonseed meals and superior to untreated flaxseed meal, previously found to be detrimental to growing chicks when fed in levels of 4.5 percent or more of the ration. The value of cottonseed meal was not affected by ammonia treatment of the seed.

23 ALTSCHUL, A. M., IRVING, G. W. Jr., GUILBEAU, W. F., and SCHAEFER, H. C.

THE NUTRITIVE VALUE OF PEANUT CAKE, MEAL, PROTEIN AND NONPROTEIN RESIDUE FOR CHICKS. Poultry Science 27 (4), 402-7 (1948).

The nutritive value of peanut meals, isolated protein fractions and protein meal residues obtained by various processing methods was investigated in comparison with soybean and cottonseed meals as the supplement in chick starting diets. The feeding experiments are described in detail, and the results summarized in two tables.

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Used as about one-fourth of the total protein supplement in an otherwise adequate diet, peanut meals supported chick growth as well as commercial screw-pressed soybean meal and were only slightly inferior to commercial hydraulic-pressed cottonseed meal. Solvent-extracted peanut meal had the same nutritional value as hydraulic-pressed peanut meal. Peanut protein preparations produced gains in weight similar to those obtained by feeding the original peanut meals. The residue remaining after extraction of protein from solvent-extracted peanut meal supported growth, but had less nutritional efficiency, expressed as the amount of feed required to produce a unit gain in weight, than either peanut meal or isolated peanut protein.

24 CASTILLON, L. E., HALL, C. M., and BOATNER, C. H.

ACUTE ORAL TOXICITY OF GOSSYPOL AND COTTONSEED PIGMENT GLANDS FOR RATS, MICE, RABBITS, AND GUINEA PIGS. Archives of Biochemistry 18 (2), 271-7 (1948).

Investigations described in this article extend to four additional animals a study of the toxicity of cottonseed pigment glands previously applied to chickens. The glands added to diets of fasting rats, mice, guinea pigs, and rabbits proved highly toxic, causing death with large doses, whereas an equivalent amount of pure gossypol affected the animals very little. No correlation was apparent between the toxicity of different samples of pigment glands and their relative contents of either gossypol or gossypurpurin.

These results, consistent with those obtained with chickens, add to the evidence that some component of cottonseed pigment glands other than, or in addition to, gossypol and gossypurpurin is responsible for their toxicity. Thermally, the toxic material is relatively stable, but it is partially inactivated by the combined action of heat and water. It is not extracted from the glands by petroleum naphthas and tetrachloroethylene but is partially extracted by ethanol, and is completely extracted by diethyl ether and acetone.

25 CASTILLON, L. E., HALL, C. M., and BOATNER, C. H.

PREPARATION OF GOSSYPOL FROM COTTONSEED PIGMENT GLANDS. J. Am. Oil Chemists' Soc. 25 (7), 233-6 (1948).

Because the nature of gossypol, as yet difficult to obtain in pure form, suggests many possibilities for use as an antioxidant and possibly in the pharmaceutical field, practical methods were sought for its extraction from cottonseed pigment glands and for its isolation from pigment gland extracts. The pigment

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glands used in the experiments were produced from whole cottonseed meal and from defatted cottonseed meal by the gland flotation process. Of the methods developed during the investigation, extraction with acetone followed by precipitation of gossypol acetic acid from the extract was found to be the preferable one for obtaining pure gossypol in good yields. Since this method is rapid and employs inexpensive and easily handled reagents, it is readily adaptable to the production of gossypol on a large scale.

Precautions which must be taken in applying the method to large scale production are discussed together with methods for the purification and preservation of gossypol.

26 GASTROCK, E. A., and D'AQUIN, E. L.

CONTINUOUS SOLVENT EXTRACTION OF COTTONSEED AND PEANUTS AT THE SOUTHERN REGIONAL RESEARCH LABORATORY. Oil Mill Gazetteer 55 (4), 13-21 (1948).

The Southern Laboratory's pilot plant equipment for studying continuous solvent extraction of oilseeds is described, and the course of the solvent and meal in the process is followed diagrammatically. The various difficulties encountered before relatively smooth operation of the plant was achieved are enumerated along with the steps taken to overcome them. In the later runs, both cottonseed and peanut flakes were extracted to a content of 1 percent, or less, of residual oil. Methods are given for the preparation for extraction of both cottonseed and peanut flakes, and the new process for mechanical separation of the pigment components of cottonseed on a pilot plant scale is described briefly.

27 LAMBOU, M. G., KING, Gladys S., and CONDON, M. Z.

EFFECT OF CHEMICAL TREATMENT PRIOR TO STORAGE ON VIABILITY AND GROWTH OF COTTONSEED. Science 108 (November 19), 563-4 (1948).

Previously reported investigations showed that a number of chemicals, including propylene glycol dipropionate and 4,6-bis-chloromethyl zylene, prevent or minimize heating and deterioration of moist seeds in storage. The present report covers studies to determine whether a mixture of these two compounds also could be used to prevent loss of viability. At intervals over a storage period of 6-1/2 months, germination tests and growth measurements were made on treated and untreated cottonseed with a moisture content of 12 percent. Viability and growth of the treated seed was maintained at a level considerably higher than that of the untreated control.

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Analysis of the seed at the end of the 6-1/2 months confirmed previous findings on the effectiveness of these two chemicals in preventing the formation of free fatty acids during storage.

28 PONS, Walter A. Jr., MURRAY, Mildred D., O'CONNOR, Robert T., and GUTHRIE, John D.

STORAGE OF COTTONSEED AND PEANUTS UNDER CONDITIONS WHICH MINIMIZE SPECTROPHOTOMETRIC CHANGES IN THE EXTRACTED OIL. J. Am. Oil Chemists' Soc. 25 (9), 308-13 (1948).

The work reported in this paper was undertaken in an effort to establish new indexes of deterioration and to further verify previous recommendations for the storage of cottonseed and peanuts. The increase in the seed of red gossypol (a term used to designate substances exhibiting absorption maxima in chloroform at 528 and 565 mμ), and also increased absorption of the extracted oil in the region of 236 mμ, proved helpful in following changes in condition during storage of the seed. Methods for applying both these indexes are described.

Cottonseed with moisture content adjusted to 8 percent or less, stored for more than a year in closed containers at 1 degree or at -18 degrees C. (conditions under which previous experiments indicated cottonseed and peanuts may be stored with no increase in free fatty acid content of the oil) showed no appreciable change in either red gossypol content of the seed, or nongossypol absorption of the extracted oil; while seed stored at room temperature, 27 degrees C., showed a large increase in both. Oil extracted from peanuts stored for more than four years at room temperature showed a much greater absorption in the region of 227 to 234 mμ than oil from peanuts stored at the lower temperatures.

29 SPADARO, J. J., PERSELL, R. M., MURPHEY, C. H. Jr., VIX, H. L. E., McCOURTNEY, E. J., HECKER, J. L., POLLARD, E. F., and GASTROCK, E. A.

PILOT-PLANT FRACTIONATION OF COTTONSEED. I. DISINTEGRATION OF COTTONSEED MEATS. J. Am. Oil Chemists' Soc. 25 (10), 345-53 (1948).

A thorough investigation of the engineering problems encountered in all stages of the recently described fractionation method of processing cottonseed has been started. One of the first steps in this process is the disintegration of cottonseed meats to detach meal tissue from the pigment gland, making separation of the whole gland possible.

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The authors present results of tests utilizing a high-speed, "dissolver-type" impeller for disintegration by liquid shear. More than 90 percent of through-80-mesh material was obtained by this type unit. Moisture content above 5 percent appreciably reduced the efficiency of disintegration and also increased power consumption and the viscosity of the slurry. Whole flakes resulted in a finer product than flakes pre-pulverized in the dry state. It was found that the presence of hulls slightly increased disintegration, power consumption and viscosity; that higher speeds (up to 6,000 FPM peripheral speed) were more efficient; and that the effect of solvents was small.

SEE ALSO NOS. 2, 3, 30, 33 and 34

Sweetpotatoes

SEE PRESS NOTICES. ALSO NOS. 33 and 34.

Miscellaneous

30 GASTROCK, E. A., VAN ARSDEL, W. B., ESKEW, R. K., and LANGFORD, C. T.

PILOT PLANTS: REGIONAL RESEARCH LABORATORIES, U. S. DEPARTMENT OF AGRICULTURE. Ind. & Eng. Chem. 40 (11), 2014-2020 (1948).

The authors review a decade's operations in the field of chemical engineering and summarize their experience with pilot plant problems in each of the four regional research laboratories operated by the Bureau of Agricultural and Industrial Chemistry.

Based on this experience, some recommendations are made about the design and operation of process development areas for future research laboratories. In general, the authors consider highly satisfactory the pilot plant areas originally designed for their laboratories--the facilities provided were versatile and the space devoted to them was well proportioned to the size of the job to be done. However, certain necessary alterations, improvements and special facilities are discussed; and further desirable changes suggested.

Limitations on the use of a single general area for diverse operations are pointed out; and problems of housekeeping, maintenance and safety cited.

31 McKENNON, F. L., D'AQUIN, E. L., GUILBEAU, W. F., MOLAISON, H. J., POMINSKI, J., and VIX, H. L. E.

RUBBER FROM GOLDENROD. India Rubber World 118 (5), 655-9, 662 (1948).

Article No.

This article summarizes laboratory and pilot plant investigations of goldenrod as a source of rubber, which were carried out under the Emergency Rubber project during World WAR II. Preliminary extraction with acetone of the dried leaves of selected strains of goldenrod, before extraction with benzol to remove the rubber, produced a soft, sticky product which a cooperating rubber company was able to blend satisfactorily with GR-S stock. A tougher and more easily handled raw rubber stock suitable for use in several commercial products was obtained by using an acetone precipitation step on the benzol miscella followed by a precuring operation.

32 REEVES, Richard E.

PHENYL β-D-GALACTOPYRANOSIDE DERIVATIVES. J. Am. Chem. Soc. 70 (11), 3963-4 (1948).

The procedure by which each of the following compounds was prepared from phenyl β-D-galactopyranoside is described: phenyl 4,7-benzylidene-β-D-galactoside; phenyl 2,3-diacetyl-4,6-benzylidene- β-D-galactoside; phenyl 2,3-dimethyl-4,6-benzylidene-β -D-galactoside; phenyl 2,3-dimethyl- β-D-galactopyranoside; phenyl 2,3-di-N-penylcarbamyl-4,6-benzylidene-β -D-galactoside; phenyl 2,3-dibenzyl-4,6-benzylidene-β -D-galactoside; and phenyl 2,3-dibenzyl- β-D-galactopyranoside. The phenyl β-D-galactopyranoside used in the experiments was prepared by catalytic deacetylation with sodium methylate of carefully purified tetra acetate.

33 SCOTT, Walter M.

INDUSTRIAL OPPORTUNITIES LATENT IN LARGER AND MORE DIVERSIFIED SOUTHERN AGRICULTURAL PRODUCTION. Proceedings, Fall Meeting Southern Association of State Planning and Development Agencies, New Orleans, La., October 25-26 (1948). Mimeographed, 8 pp.

Importance of planning in a program of effective research is emphasized and illustrated by a review of the factors considered in establishing the U. S. Department of Agriculture's four regional research laboratories. Then the discussion turns to some of the major projects of the Southern Laboratory which have reached the stage of engineering development and show promise of successful adaptation to commercial use.

Suggested particularly for the consideration of planning and development agencies are the potential importance of peanuts as the raw material for peanut protein fiber; the Laboratory's studies of cottonseed processing methods; application of the differential dye test in cotton manufacturing and of chemical

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finishing studies in making tobacco shade cloth; and the potential commercial possibilities of the process for recovering starch from sweetpotatoes.

34 SCOTT, Walter M.

RESEARCH ON SOUTHERN AGRICULTURAL PRODUCTS. Proceedings of the Thirty-Ninth Annual Meeting, American Railway Development Association, April 5-7, pp. 38-47 (1948). Mimeographed.

The increased utilization of southern farm products made possible through scientific research is discussed as a contribution to the future welfare of the South, and the Southern Regional Research Laboratory's part in this research is outlined. Efforts are directed towards modifying the qualities of cotton and cottonseed, sweetpotatoes, peanuts and rice, so as to make these leading southern commodities suitable for new or enlarged technical, scientific and industrial uses.

The importance of each of these commodities to the industrial development of the South is emphasized by an analysis of its present economic position and competition from other products. Examples of research which are helping to provide enlarged markets are cited.

PRESS NOTICES

Science Helps Secure King Cotton's Crown. USDA 2631-48. December 15, 1948.

Chemical Treatment Will Keep Cottonseed From Spoiling in Storage. USDA 2673-48. December 21, 1948.

White Starch Made From Sweetpotatoes by New Process. Research Achievement Sheet 110 (C). October 1948.

PATENTS

Process of Making Cotton Textiles Water-Absorbent and Rot-Resistant. John David Reid and George C. Daul. U. S. Patent No. 2,448,153. August 31, 1948.

Method of Producing Cotton Cordage. Charles F. Goldthwait and Herbert O. Smith. U. S. Patent No. 2,449,215. September 14, 1948.